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## A Denning Aggregation of the Western Cottonmouth

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During a two day period, April 5-6, 1947, two brief trips were made to the Verdigris River bottoms about 6 miles east of Catoosa in Rogers County, Oklahoma. In the course of the collecting 40 specimens of *Agkistrodon piscivorus leucostoma* (Troost) were taken at a denning site in a situation which is perhaps comparable with those indicated by Gloyd (1938, p. 121-123) and Cagle (1942, p. 193) in Missouri and Illinois, respectively.

In this specific area in northeastern Oklahoma the Verdigris River flows in a fairly straight course through tall grass prairie with rather dense woods on the bottomland and nearby slopes. Along the east side of the river there is a bluff which rises to a height of 150 feet above the floodplain. The woodland at the base of the bluff is predominantly elm-oak-hackberry while that on the bluff is predominantly oak-hickory.

The cottonmouths were found about outcroppings of limestone and sandstone which occur just below the crest of the bluff. Many fissures and crevices penetrate the rock and many holes lead into the ground beneath loose slabs of rock. The den area extends for about a mile and a half along the bluff which winds sharply in and out from the river. Cottonmouths were secured at various places in this area but were most heavily concentrated at the northern end of the bluff, especially on the northeast facing slopes which were very damp because of seepage.

Denning in company with the cottonmouths were numbers of copperheads (*Agkistrodon mokeson* subsp.) and coachwhips (*Masticophis f. flagellum*). Although the three species were found together to some extent, each apparently had a special habitat preference. The copperheads collected seemed to be a sample of an intergrade population showing the influence of both *A. m. laticinctus* (as will be discussed in a subsequent paper). In contrast to the cottonmouths, the copperheads showed a preference for the drier parts of the bluff, usually the east and southeast exposures. The coachwhips were most often encountered on the more open slopes. Other reptiles including *Tantilla gracilis*, *Carphophis amoena vermis*, *Haldea striatula*, *Diadophis punctatus amyi*, *Coluber constrictor flaviventris*, *Eumeces fasciatus*, *Leiopeltis laterale*, and

*Sceloporus undulatus* subsp., were very numerous on the slopes; and a single *Elaphe obsoleta obsoleta* was collected not far away.

Previous collections by the senior author in the river bottom at the base of the bluff (where cottonmouths are moderately common about lakes and sloughs in the summer) have revealed specimens as early as March. Such early collection dates suggest the possibility that specimens also hibernate in the vicinity of the summer habitat, perhaps utilizing crayfish holes and rodent burrows for this purpose. There are too few decaying stumps available to suggest denning of the type described by Neill (1947, p. 204). If the former is the case, then presumably some of the cottonmouths of the area remain in the immediate vicinity of water while others migrate to hillside dens approximately one-half mile from and 150 feet above the nearest permanent water. The situation is further complicated by the occurrence of annual floods in the river bottoms each April at which time the cottonmouths that have gone to the hills are still in the vicinity of the dens which remain dry, while other cottonmouths that hibernate in the vicinity of water are presumably flooded out.

The area studied marks the apparent northwest fringe of the range of the cottonmouth in Oklahoma. Specimens in the collection of the senior author extend the range northward from the den-site about ten miles into Rogers County and southward into Wagoner County. Other records indicate that the species is not uncommon on the Verdigris River and its tributaries: Mohawk Park, Tulsa County, Oklahoma (Hugh S. Davis, personal communication); "Verdigris River bottom," Oklahoma (Force, 1930, p. 37); and on the Neosho River, due east of Chetopa, Cherokee County, Kansas (Hall and Smith, 1947, p. 453).

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